



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/733,754

12/11/2003

Harvey G. Kiel

ROC920030306US1

8410

30206

7590

04/30/2008

IBM CORPORATION  
ROCHESTER IP LAW DEPT. 917  
3605 HIGHWAY 52 NORTH  
ROCHESTER, MN 55901-7829

EXAMINER

THOMPSON, JR, OTIS L

ART UNIT

PAPER NUMBER

2619

MAIL DATE

DELIVERY MODE

04/30/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/733,754	<b>Applicant(s)</b> KIEL ET AL.	
	<b>Examiner</b> OTIS L. THOMPSON, JR	<b>Art Unit</b> 2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Response to Arguments***

1. Applicant's arguments filed on February 27, 2008 with respect to claims 1-42 have been considered but are moot in view of the new ground(s) of rejection.

Regarding Applicant's arguments for independent claims 1, 6, 10, 12, 17, 22, 26, 28, and 33, the rejections have been updated to include a new grounds of rejection as stated below in section 4 where claim 1 is rejected, section 13 where claims 6 and 22 are rejected, section 16 where claims 10 and 26 are rejected, section 19 where claims 12, 28, and 33 are rejected, and section 25 where claim 17 is rejected.

Furthermore, regarding Applicant's arguments for independent claims 12, 28, and 33, the amendment to the claims recites features that were rejected in the Non-Final Office Action mailed on November 27, 2007. These features include *selecting, via a partition management tool included in one of the partitions, the new partition to share the adapter; and send the address of the selected partition to a firmware of the computer system*. Applicant states that these features are neither taught nor obvious over the prior art presented in the Non-Final Office Action. Examiner respectfully disagrees with Applicant because these features are taught in the Fernandes et al. and the McMichael et al. references.

McMichael et al. discloses the *partition management tool* (Abstract, see "...partition manager). McMichael et al. further discloses in the abstract that this partition manager enables the dynamic creation (i.e. *new partition*), reconfiguration, and deletion of logical volumes (i.e. logical partitions).

Fernandes et al. discloses a method for allowing a partition to share the network adapter (i.e. *new partition sharing the adaptor*). Referring to figure 3, Fernandes et al.

Art Unit: 2619

discloses that a primary partition (i.e. *host partition on which the partition management tool resides*) initially takes control of the resource to be shared (LPAR1 assumes ownership and control of network adapter 225 via driver code identified as NIC driver 310). Fernandes et al. further discloses *sending the address of the selected partition to a firmware of the computer system* (Column 4, paragraphs 21-22; Column 5, paragraphs 23-25, see "...Each logical partition that wants to share...is required to send a unique identifier [MAC address or a set of low level network identifiers] [i.e. sending the address of the selected partition] to LPAR1 and NIC driver 310 [i.e. firmware of the computer system] in order to register...").

The feature of *selecting the new partition* is actually inherent in the methods disclosed in McMichael et al. and Fernandes et al. This is so because in order for the partition manager to be able to communicate with a newly created partition or a partition that needs to be reconfigured, it has to first know and choose the partition from among other partitions that may exist.

Section 19 of this office action has been updated to more clearly show that the previously presented prior art does satisfy the limitations of independent claims 12, 28, and 33.

#### DETAILED ACTION

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2619

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gioquindo et al. (U.S. 2002/0029286 A1) in view of Yamaguchi et al (US 2002/0091786 A1).

4. As to claim 1, Gioquindo et al. discloses a method for communication between multiple partitions that share a communications adapter. In figure 6 an example method of the communication is provided. In step 200, LPAR 3 constructs an IP datagram to send to 9.117.34.254 (corresponding IP address for LPAR 1). In step 210 the IP datagram is passed to the channel driver and no LAN information is needed in the packet. In step 220 the packet is transmitted across the channel to the OSA (Open Systems Adapter). In step 230 the OSA uses the destination IP address 9.117.34.254 to look up the entry in the Address Resolution Protocol (ARP) cache. The entry is found in step 240, and the IP datagram is forwarded to LPAR 1 without ever being transmitted onto the LAN. The OSA is capable of communicating with different media types such as Fiber Distributed Data Interface, token ring, or Ethernet (Column 6, paragraph 32).

Gioquindo et al. does not specifically disclose *transferring via a processor including executable code that is usable to send partition information from a partition management tool to a hosting partition.*

However, Yamaguchi et al. discloses *transferring via a processor* (Figure 13 labels 1000-1008, see "IP0-IP8", where IP is instruction processor) *including executable code* (Figure 1 label 171, see "HYPERVISOR PROGRAM") *that is usable to send partition*

Art Unit: 2619

*information from a partition management tool to a hosting partition* (Paragraph 0038, see "...hypervisor program 171...control program for controlling...to operate as a plurality of LPARS...LPAR issues a command by way of the hypervisor program...hypervisor program is executed on one of the IPs 1000 to 1008. The advantage of the hypervisor program is that it performs LPAR load-balancing on a Web server and provides an operating system which can operate on each LPAR separately (Paragraph 0038, see "...load-balancing...separate operating system...").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Yamaguchi et al. into Gioquindo et al. in order to perform LPAR load-balancing on a Web server and provide an operating system which can operate on each LPAR separately.

5. As to claim 3, Gioquindo et al. in view of Yamaguchi et al. discloses step 230 of the method shown in figure 6. In this step, the destination is determined by looking up the 9.117.34.254 IP address in an ARP cache. In step 240 the entry in the ARP cache is found to be the corresponding IP address for LPAR 1.

6. As to claim 4, Gioquindo et al. in view of Yamaguchi et al. discloses, in step 230 of the method shown in figure 6, that an IP address stored in the ARP cache is used to determine the destination partition for a packet.

7. As to claim 5, Gioquindo et al. in view of Yamaguchi et al. discloses step 220 in which the packet is transmitted across the channel to the OSA. Gioquindo et al. further discloses step 230 of figure 6 in which an ARP cache (table) stored in the OSA is accessed to look up the 9.117.34.254 IP address. In the ARP cache, provision is made for

Art Unit: 2619

partition-to-partition communication of IP datagrams by storing IP addresses of the LPARS as home addresses (Abstract).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art Gioquindo et al. (U.S. 2002/0029286 A1) in view of Yamaguchi et al. (US 2002/0091786 A1) as applied to claim 1 above, and further in view of Duncan et al. (U.S. 2003/0149844 A1).

10. Gioquindo et al. in view of Yamaguchi et al. discloses the claimed invention above but fails to specifically disclose the generation of an interrupt and a message signaling interrupt (MSI) to notify each of the one or more partitions to which a frame or packet is transferred of the frame or packet.

However, Duncan et al. discloses a method in which a source partition is able to generate an MSI using its interrupt engine. The interrupt engine passes the MSI to the interrupt port of the receiving partition (Column 10, paragraph 46). This interrupt serves the purpose of coherently moving information between source and destination partitions.

Art Unit: 2619

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to incorporate the teachings of Duncan et al. into the system of Gioquindo et al. in view of Yamaguchi et al. by using an interrupt engine to generate MSI messages in order to coherently move information between source and destination partitions.

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 6-9, 22-25, 37, and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandes et al. (U.S. 2003/0236852) in view of Yamaguchi et al. (US 2002/0091786 A1) in view of Gioquindo et al. (U.S. 2002/0029286 A1), and further in view of Condon (U.S. 5,956,714).

13. Fernandes et al. discloses a data processing system comprising a plurality of processors (Figure 1, labels 102a and 102b), a system memory (Figure 1, label 106), multiple logical partitions (Figure 1, labels 101a and 101b), and a network adapter being shared by multiple partitions and coupled to the aforementioned components (Figure 2, label 225) that transmits packets to one or more of the logical partitions.

Fernandes et al. further discloses the forwarding of a broadcast packet to each registered LPAR. Referring to figure 3, Fernandes et al. discloses that all data packets



Art Unit: 2619

traversing network 230 will be received and accepted by adapter 225. NIC driver 310 then performs software filtering and routing of each packet based upon MAC address. If the MAC address indicates that the corresponding packet is a broadcast packet, NIC driver 310 will forward the packet to each registered LPAR typically via the inter-LPAR communication facility (Column 5, paragraph 26).

Fernandes et al. does not specifically disclose *transferring via a processor including executable code that is usable to send partition information from a partition management tool to a hosting partition.*

However, Yamaguchi et al. discloses *transferring via a processor* (Figure 13 labels 1000-1008, see "IP0-IP8", where IP is instruction processor) *including executable code* (Figure 1 label 171, see "HYPERVISOR PROGRAM") *that is usable to send partition information from a partition management tool to a hosting partition* (Paragraph 0038, see "...hypervisor program 171...control program for controlling...to operate as a plurality of LPARS...LPAR issues a command by way of the hypervisor program...hypervisor program is executed on one of the IPs 1000 to 1008. The advantage of the hypervisor program is that it performs LPAR load-balancing on a Web server and provides an operating system which can operate on each LPAR separately (Paragraph 0038, see "...load-balancing...separate operating system...").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Yamaguchi et al. into Fernandes et al. in order to perform LPAR load-balancing on a Web server and provide an operating system which can operate on each LPAR separately.

Fernandes et al. in view of Yamaguchi et al. does not specifically disclose the polling of a transmit queue in order to determine if a partition has a frame or packet to transmit, the accessing of a table stored in the adapter to select a partition to which a frame or packet is to be sent, and the selection of a frame or packet based on a priority value stored in the table.

However, Gioquindo et al discloses an ARP (address resolution protocol) cache (table) stored in an OSA (open systems adapter) that is designed to store full MAC address headers and IP addresses of logical partitions for the purpose of partition-to-partition communication of IP datagrams (Abstract; Column 7, paragraph 46); and Condon discloses a queuing system using a relational database which serves the purpose of manipulating items sent between a plurality of application servers.

In figure 3, Condon describes a process by which the server selects items from the queue using the logical partition number. At step 20, a logical partition number is selected. Each logical partition number has a plurality of rows associated with the logical partition number. At step 22 access to the rows associated with the selected partition number is locked. The server then monitors all rows associated with the logical partition number at step 24 to determine if any items are ripe for dequeuing, taking into account the type of queue being monitored. If a ripe item is found at step 25, the server dequeues the ripe item at step 26 and forwards it to a proper application server at step 28 (Column 5, lines 32-45). Condon also discloses that various types of queues may be implemented, for example time based, priority based, and FIFO based queues. Priority based queues give certain items a higher priority with respect to other items on the

Art Unit: 2619

queue. Items having a high priority are dequeued before items at the front of the queue (Column 4, lines 40-42 and 50-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to combine the teachings of Condon with the teachings of Fernandes et al. in view of Yamaguchi et al. in view of Gioquindo et al. in order to enable the communication of IP datagrams between partitions and in order to manipulate items sent between a plurality of application servers.

### ***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 10, 11, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandes et al. (U.S. 2003/0236852) in view of Arndt et al. (2004/0202189 A1) in view of Gioquindo et al. (U.S. 2002/0029286 A1), and further in view of Schmidt et al. (6,854,021 B1).

16. Fernandes et al. discloses a data processing system comprising a plurality of processors (Figure 1, labels 102a and 102b), a system memory (Figure 1, label 106), multiple logical partitions (Figure 1, labels 101a and 101b), and a network adapter being shared by multiple partitions and coupled to the aforementioned components (Figure 2, label 225) that transmits packets to one or more of the logical partitions.

Art Unit: 2619

Fernandes et al. does not specifically disclose that *at least one partition employs at least two receive queues and two transmit queues.*

However, Arndt et al. discloses a logical partitioning system in which each logical host channel adapter (1282-1286 of Figure 12) may have a plurality (i.e. two or more) of queue pairs (1232-1242 of Figure 12) assigned to a logical partition (i.e. employing queue pairs) (Paragraph 0133, see "...plurality of queue pairs...assigned to a logical partition..."). This provides access to multiple physical ports that exist in the system (Paragraph 0133, see "...configured to provide access to multiple physical ports...").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Arndt et al. into Fernandes et al. in order to provide access to multiple physical ports.

Fernandes et al. in view of Arndt et al. does not specifically disclose that the network adapter includes a table, that each partition employs a receive queue and a transmit queue, that the table stored on the network adapter is accessed in order to determine where data is to be sent, and that at least one transmit queue of one of the partitions transfers data to the network adapter and the network adapter transmits the data to the receive queue of one the partitions based on data stored in the table.

However, Gioquindo et al discloses an ARP (address resolution protocol) cache (table) stored in an OSA (open systems adapter) that is designed to store full MAC address headers and IP addresses of logical partitions for the purpose of partition-to-partition communication of IP datagrams (Abstract; Column 7, paragraph 46); and Schmidt et al. discloses a method and apparatus for sending data from one partition to a second partition within a logically partitioned computer. Referring to figure 2, Schmidt

Art Unit: 2619

et al. discloses a schematic diagram of a single computer divided up into a number of logical partitions 212a-212n, each partition having discrete servers 214a-214n respectively. Each discrete server has a TCP/IP layer 216a-216n respectively, and below that a device driver 218a-218n respectively for the purpose of driving data transmissions between discrete servers. Each device driver has a send queue 222a-222n respectively, and a receive queue 220a-220n respectively. A common lookup table 224 is a centralized table defining the discrete servers 214a-214n within the computer 210 (Column 4, lines 24-39).

Schmidt et al. further discloses that the send queue and receive queue are registered in the lookup table, which is visible to all partitions. A send instruction interrogates the lookup table to locate the send queue and the receive queue, and sends the data in the send queue in the first logical partition to the receive queue in the second logical partition. The method and apparatus disclosed in Schmidt et al. serves the purpose of allowing data to be transferred between discrete servers in logical partitions while maintaining security between the logical partitions (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to combine the teachings of Schmidt et al. with the system of Fernandes et al. in view of Arndt et al. in view of Gioquindo et al. in order to enable partition-to-partition communication of data and to maintain security between partitions while doing so.

***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 12-16 and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernandes et al. (U.S. 2003/0236852) in view of admitted prior art Gioquindo et al. (U.S. 2002/0029286 A1), and further in view of McMichael et al. (U.S. 2003/0023826 A1).

19. Fernandes et al. discloses the following elements of the rejected claims:

A data processing system comprising a plurality of processors (Figure 1, labels 102a and 102b), a system memory (Figure 1, label 106), multiple logical partitions (Figure 1, labels 101a and 101b), and a network adapter being shared by multiple partitions and coupled to the aforementioned components (Figure 2, label 225).

Fernandes et al. further discloses that the data processing system allows the other partitions to share the network adapter by means of registration with the host partition (Abstract).

Fernandes et al. further discloses a method for allowing a partition to share the network adapter. Referring to figure 3, Fernandes et al. discloses that a primary partition initially takes control of the resource to be shared (LPAR1 assumes ownership and control of network adapter 225 via driver code identified as NIC driver 310). NIC

Art Unit: 2619

driver 310 is contained inside the host partition LPAR1. After taking control of the network adapter, the owning partition configures the resource to recognize and accept all traffic on the network. Fernandes et al. further discloses *sending the address of the selected partition to a firmware of the computer system* (Column 4, paragraphs 21-22; Column 5, paragraphs 23-25, see "...Each logical partition that wants to share...is required to send a unique identifier [MAC address or a set of low level network identifiers] [i.e. sending the address of the selected partition] to LPAR1 and NIC driver 310 [i.e. firmware of the computer system] in order to register..."). Once the NIC driver 310 and LPAR1 have received the unique identifier (MAC address), hardware filtering of packets is deactivated on the registered partition and then maintained by the host partition LPAR1. The NIC driver 310 maintains a list of registered MAC addresses and forwards a packet to a partition if a match is detected (Abstract).

Fernandes et al. does not specifically disclose a partition management tool, the creation of a new partition in the new computer system, and a table stored in the adapter.

However, Gioquindo et al. discloses an ARP (address resolution protocol) cache (table) stored in an OSA (open systems adapter) that is designed to store full MAC address headers and IP addresses of logical partitions for the purpose of partition-to-partition communication of IP datagrams (Abstract; Column 7, paragraph 46); and McMichael et al. discloses *selecting, via a partition management tool included on one of the partitions, the new partition to share the adapter* (Abstract, see "...partition manager [i.e. partition management tool] that enables the dynamic creation...of logical volumes...assigning partitions on a connected device to volume managers which create

Art Unit: 2619

the logical volumes..."). This partition manager fulfills the need for an operating system that supports dynamic changes in the characteristics of physical devices underlying logical volumes without requiring that the higher layers of the operating system and user applications modify the addresses of the logical volumes (Column 2, paragraph 10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to combine the teachings of McMichael et al. with Fernandes et al. and Gioquindo et al. in order to store the IP or MAC addresses of logical partitions and to allow for dynamic changes in physical devices without requiring that the operating system and user applications modify the addresses of logical volumes.

### ***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art Gioquindo et al. (U.S. 2002/0029286 A1) in view of Yamaguchi et al. (2002/0091786 A1) as applied to claim 1 above, and further in view of Fernandes et al. (U.S. 2003/0236852 A1).

22. Gioquindo et al. in view of Yamaguchi et al. discloses the claimed invention above but does not specifically disclose the detection of a broadcast frame or packet and transferring the broadcast frame or packet from the adapter to all of the partitions.



Art Unit: 2619

However, Fernandes et al. discloses the following method for the purpose of forwarding a broadcast packet to each registered LPAR. Referring to figure 3, Fernandes et al. discloses that all data packets traversing network 230 will be received and accepted by adapter 225. NIC driver 310 then performs software filtering and routing of each packet based upon MAC address. If the MAC address indicates that the corresponding packet is a broadcast packet, NIC driver 310 will forward the packet to each registered LPAR typically via the inter-LPAR communication facility (Column 5, paragraph 26).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to incorporate the teachings of Fernandes et al. into the system of Gioquindo et al. in view of Yamaguchi et al. by using a NIC driver coupled with a network adapter in order to forward broadcast packets to each registered LPAR.

### ***Claim Rejections - 35 USC § 103***

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claims 17 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art Kubala (U.S. 5,564,040) in view of Yamaguchi et al.

(2002/0091786 A1), and further in view of Gioquindo et al. (U.S. 2002/0029286 A1).

Art Unit: 2619

25. Kubala discloses an apparatus for providing a server function in a logically partitioned hardware machine comprising a central processing complex that contains one or more central processors (Figure 1, label 103) and main memory for system 100 pictured in figure 1. Kubala further discloses logical partitions 107-109 in figure 1, each of which functioning as a separate hardware machine and having its own operating system (Column 2, lines 65-67; Column 3, lines 1-12).

Kubala does not specifically disclose *transferring via a processor including executable code that is usable to send partition information from a partition management tool to a hosting partition.*

However, Yamaguchi et al. discloses *transferring via a processor* (Figure 13 labels 1000-1008, see "IP0-IP8", where IP is instruction processor) *including executable code* (Figure 1 label 171, see "HYPERVISOR PROGRAM") *that is usable to send partition information from a partition management tool to a hosting partition* (Paragraph 0038, see "...hypervisor program 171...control program for controlling...to operate as a plurality of LPARS...LPAR issues a command by way of the hypervisor program...hypervisor program is executed on one of the IPs 1000 to 1008. The advantage of the hypervisor program is that it performs LPAR load-balancing on a Web server and provides an operating system which can operate on each LPAR separately (Paragraph 0038, see "...load-balancing...separate operating system...").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Yamaguchi et al. into Kubala in order to perform LPAR load-balancing on a Web server and provide an operating system which can operate on each LPAR separately.

Art Unit: 2619

Kubala in view of Yamaguchi et al. does not specifically disclose a multiple queue Ethernet adapter coupled to the processors, main memory, and partitions including cache memory, a register, and a table wherein the adapter receives a frame or packet, determines whether the frame or packet is for one of the partitions, stores the frame or packet in cache memory, determines the destination partition, and transfers the frame or packet to the destination partition. Kubala also does not specifically disclose that the apparatus accesses a table stored on the adapter to determine the partition where a frame or packet is to be sent, that sending is based on at least one of a MAC address, VLAN ID/MAC address pair, or an IP address stored in the table, and that accessing a value stored in a register indicating the type of address is used to determine, from data stored in the table, to which partition a packet of frame should be sent.

However, Gioquindo et al. discloses, in figure 6, an example method for the purpose of communication and data processing between partitions by sharing an adapter. In step 200, LPAR 3 constructs an IP datagram to send to 9.117.34.254 (corresponding IP address for LPAR 1). In step 210 the IP datagram is passed to the channel driver and no LAN information is needed in the packet. In step 220 the packet is transmitted across the channel to the OSA (Open Systems Adapter). In step 230 the OSA uses the destination IP address 9.117.34.254 to look up the entry in the Address Resolution Protocol (ARP) cache. The entry is found in step 240, and the IP datagram is forwarded to LPAR 1 without ever being transmitted onto the LAN. The OSA is capable of communicating with different media types such as Fiber Distributed Data Interface, token ring, or Ethernet (Column 6, paragraph 32).

Gioquindo et al. further discloses step 230 of the method shown in figure

Art Unit: 2619

6, which serves the purpose of determining the destination partition. In this step, the destination is determined by looking up the 9.1 17.34.254 IP address in an ARP cache. In step 240 the entry in the ARP cache is found to be the corresponding IP address for LPAR 1.

Gioquindo et al. further discloses, in step 230 of the method shown in figure 6, that an IP address stored in the ARP cache is used to determine the destination partition for a packet. The purpose of the IP address is to identify each individual partition.

Gioquindo et al. further discloses step 220 in which the packet is transmitted across the channel to the OSA. In step 230 of figure 6 an ARP cache (table) stored in the OSA and is accessed to look up the 9.1 17.34.254 IP address. In the ARP cache, provision is made for partition-to-partition communication of IP datagrams by storing IP addresses of the LPARS as home addresses (Abstract). The purpose of the ARP cache is to house addresses of the logical partitions so that the destination partition can be determined.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to incorporate the teachings of Gioquindo et al. into the system of Kubala in view of Yamaguchi et al. in order to determine the destination partition for a packet, to identify each individual partition, to transmit the packet to the determined destination partition, and to communicate and share data between partitions using a shared adapter.

***Claim Rejections - 35 USC § 103***

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

27. Claims 18 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art Kubala (U.S. 5,564,040) in view of Yamaguchi et al. (2002/0091786 A1) in view of Gioquindo et al. (U.S. 2002/0029286 A1) as applied to claim 17 above, and further in view of Duncan et al. (U.S. 2003/0149844 A1).

28. Kubala in view of Yamaguchi et al. in view of Gioquindo et al. discloses the claimed invention above but lacks the teachings of generating an interrupt and generating a Message Signaling Interrupt (MSI) to notify a partition of transferred packet.

However, Duncan et al. discloses a method in which a source partition is able to generate an MSI using its interrupt engine. The interrupt engine passes the MSI to the interrupt port of the receiving partition (Column 10, paragraph 46). This interrupt serves the purpose of coherently moving information between source and destination partitions.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to incorporate the teachings of Duncan et al. into the system of Kubala in view of Yamaguchi et al. in view of Gioquindo et al. by

Art Unit: 2619

using an interrupt engine to generate MSI messages in order to coherently move information between source and destination partitions.

***Claim Rejections - 35 USC § 103***

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

30. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art Kubala (U.S. 5,564,040) in view of Yamaguchi et al. (2002/0091786 A1) in view of Gioquindo et al. (U.S. 2002/0029286 A1) as applied to claim 17 above, and further in view of Fernandes et al. (U.S. 2003/0236852 A1).

31. Kubala in view of Yamaguchi et al. in view of Gioquindo et al. discloses the claimed invention above but lacks the teaching of determining if a frame or packet is a broadcast frame or packet and transmitting the broadcast frame or packet to all of the partitions that share the adapter.

However, Fernandes et al. discloses the following method for the purpose of forwarding a broadcast packet to each registered LPAR. Referring to figure 3, Fernandes et al. discloses that all data packets traversing network 230 will be received and accepted by adapter 225. NIC driver 310 then performs software filtering and routing of each packet based upon MAC address. If the MAC address indicates that the corresponding packet is a broadcast packet, NIC driver 310 will forward the packet to

Art Unit: 2619

each registered LPAR typically via the inter-LPAR communication facility (Column 5, paragraph 26).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to incorporate the teachings of Fernandes et al. into the system of Kubala in view of Yamaguchi in view of Gioquindo et al. by using a NIC driver coupled with a network adapter in order to forward broadcast packets to each registered LPAR.

### ***Conclusion***

32. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Otis L. Thompson, Jr. whose telephone number is

Art Unit: 2619

(571)270-1953. The examiner can normally be reached on Monday to Thursday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

//Otis L Thompson, Jr./  
Examiner, Art Unit 2619

April 24, 2008

/Chirag G Shah/  
Supervisory Patent Examiner, Art Unit 2619